Name _____ Date_____

A2 CC Q2T2 Review

Show all work on a separate sheet of paper. **This review is not comprehensive, be sure to study your old notes, tests, and homework assignments!**

1. Divide the following and express the answer in the form: $q(x)+\frac{r}{divisor}$:

   a) $(6x^2-7x-5)\div(3x-5)$

   b) $(3x^2+5x^3+1)\div(x+2)$

   c) $(7x^2-23x+6)\div(x-3)$

   d) $(x^4-5x+10)\div(x+3)$

2. Show that $(x-2)$ is a factor of P(x) = $x^3-3x^2-10x+24$, and find the other two factors.

3. What is the remainder when $3x^{107}+14x^{35}-16x$ is divided by $(x-1)$?

4. What is the remainder when $14x^{10}-2x^3-17$ is divided by $(x+2)$?

5. Determine if $(x+3)$ is a factor of $f(x)=x^3+x^2-5x+3$

6. Determine if $(x+1)$ is a factor of $f(x)=x^3-13x^2+23x-11$

7. If $(x+16)$ is a factor of f(x) then what is one of the zeros?

8. If $(2x-3)$ is a factor of f(x) than what is one of the roots?

9. If $f(x)=(x-3)(2x-1)(3+x)$ than what are the roots?

10. If $f(8)=0$, what is one of the factors of f(x)?

11. If $f\left(\frac{3}{2}\right)=0$, what is one of the factors of f(x)?

For questions 12-15 find the complete factorization:

12. $f(x)=x^3+2x^2-8x$

13. $P(x)=x^3-5x^2-4x+20$

14. $P(x)=x^3-2x^2+4x-8$

15. $P(x)=2x^5-28x^3-64x$

For questions 16-18 find the solution set:

16. $f(x) = 3x^3 + 11x + 5x - 3$; (hint: -1 is a zero)

17. $f(x) = (x^2 + 3x + 5)(2x + 3)$

18. $P(x) = 2x^5 - 28x^3 - 64x$

For questions 19-20 express the solution:

a) on a number line **b)** in set builder notation **c)** in interval notation

19. $\dfrac{5x+1}{x+3} \geq 3$

20. $\dfrac{x^2 - 6x + 9}{x^2 + 5x - 6} < 0$

21. Determine the equation of a cubic function whose zeros are -1, -2, and -3 and which passes through the point (2,10).

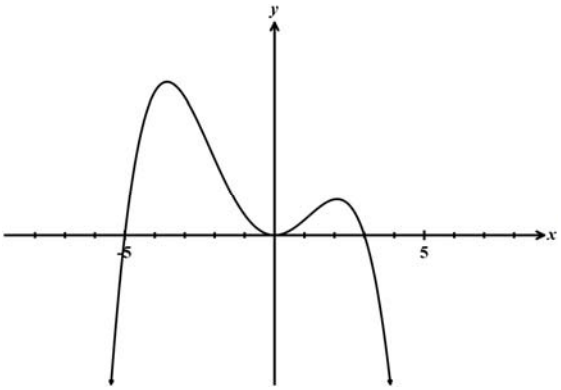
22. Which of the following could be the equation of the polynomial graph shown below?

(1) $y = -x(x+5)(x-3)$

(2) $y = x(x+3)(x-5)$

(3) $y = -x^2(x+5)(x-3)$

(4) $y = x^2(x+3)(x-5)$



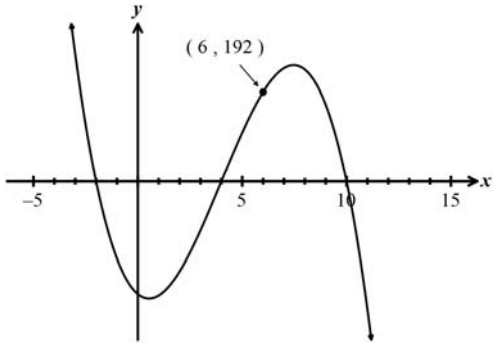
23. The cubic polynomial shown graphed below passes through the point $(6, 192)$ as shown. Which of the following is the value of the leading coefficient of the polynomial?

(1) -7

(2) -3

(3) $\dfrac{1}{3}$

(4) 5



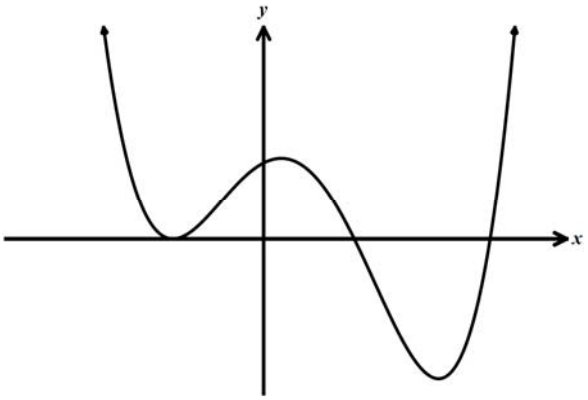
24. Which of the following is a factor of the cubic polynomial $x^3 - 10x^2 + 11x + 70$?

(1) $x + 10$ (3) $x - 7$

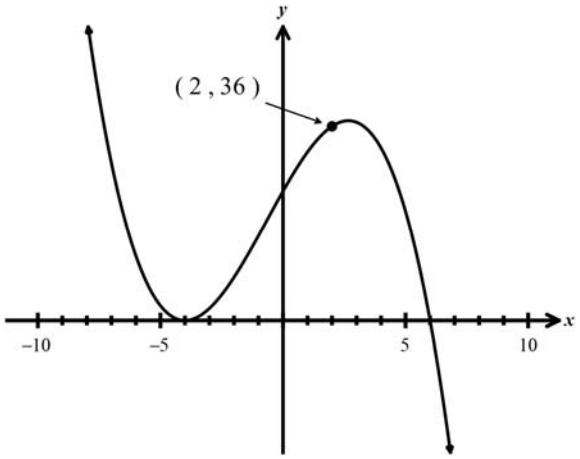
(2) $x - 2$ (4) $x + 5$

25. Given the cubic polynomial $f(x) = x^3 - 5x^2 - 4x + 20$ answer the following.

(a) Find the *x*-intercepts of this function algebraically. Show how you arrived at your answer.
(b) Explain why the graph below could *not* represent that of $f(x)$.



26. The cubic polynomial below has zeroes at $x = -4$ and $x = 6$ only and passes through the point $(2, 36)$ as shown. Algebraically determine its equation in factored form. Show how you arrived at your answer.



27. Express the following division problem in simplest terms.

$$\frac{5x^2 + 30x}{10x^2} \div \frac{36 - x^2}{x^2 - 4x - 12}$$

28. The rational expression $\dfrac{4x^3 - 2x^2 + 8x + 10}{x - 5}$ can be written as $p(x) + \dfrac{k}{x - 5}$, where $p(x)$ is a quadratic polynomial and *k* is a constant.

(a) Determine the equation for $p(x)$. Show how you arrived at your answer.
(b) Is $x - 5$ a factor of $4x^3 - 2x^2 + 8x + 10$? Explain how your reasoning.

29. What is the solution set for the inequality $x^2 - 4x - 5 < 0$?

30. The roots of the equation $x^2 + 6x = -11$ are

a. Real, Rational, and Unequal

b. Real, Rational, and Equal

c. Real, Irrational, and Unequal

d. Imaginary

31. The roots of the equation $ax^2 + 4x = -2$ are real and equal when *a* is equal to what value?

32. Solve for x: $\sqrt{7x-3} + 3 = 2x$

33. Simplify: $\dfrac{\frac{a}{b} - \frac{b}{a}}{\frac{1}{a} + \frac{1}{b}}$

34. Solve for x: $\dfrac{7}{x} - 4 = \dfrac{-4x}{x+1}$

35. Express $2\sqrt{-50} - 3\sqrt{-8}$ in simplest form